Portugal and its Venture Capital industry – An analysis on the portuguese companies backed-up by Venture Capital

Renato José Calvário Moreira

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Oriented by:

Paulo Jorge Marques de Oliveira Ribeiro Pereira

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Abstract

The banks are increasingly more under surveillance of the legislators in matters of risk and money allocation which may prevent more risky companies, like start-ups, access to financing, and it is here where the Venture Capital (VC) may play an important role. The VC may help foster the growth of the industries with its financing to this young and mostly technology-driven companies. This way, it is essential to understand what VC is and what is its impact on the companies backed-up by it.

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1. Introduction

It is now ten years since the 2008 financial crisis happened. A crisis that had a worldwide impact and that as a consequence originated profound changes in the legislation affecting the financial areas. Portugal was not an exception and all was affected by it.

All of the negative consequences that came upon the Portuguese people were used as a propeller for the growth and the development of the entrepreneur mindset. This type of mindset has been having an essential role in the dynamization of the Portuguese industry, fostering the growth of the same, by looking at the opportunities that came up with the crisis and using them to thrive on. Most of these entrepreneurs have been relying on angel investors, equity crowdfunding and venture capital in order to develop their ideas and develop their businesses, because of the difficulty to raise capital in open markets or secure a debt loan when these ideas/companies are still too small and risky.

Although it is a trending topic in the Portuguese industry and newspapers, it is essential to clarify what Venture Capital is, what is the impact of it in the companies backed by it, and in which ways, talking about Private Equity is not the same as talking about Venture Capital.

The goal of this dissertation is to distinguish Venture Capital from Private Equity and find out if this growth of Venture Capital in the Portuguese environment has been beneficial to the Portuguese companies backed-up by it or, by opposite it has been having a negative impact on them, in performance indicators like the productivity, efficiency, and growth.

This dissertation is composed by a literature review regarding the topic that includes a summary about Private Equity and Venture Capital and their main characteristics, in Chapter 2. The presence of VC in Portugal will be reflected in Chapter 3. In Chapter 4, will be presented the methodology and sample used in the analysis, as well as the results. Chapter 5 will finish with a conclusion of the analysis regarding the impact of Venture Capital in companies backed by it in Portugal.

2. Literature Review

2.1 Private Equity and Venture Capital

A Private Equity (PE) fund has as primary goal the maximization of its financial return. That goal is usually reached through a sale or an initial public offering (IPO). The PE fund helps the firms that it invested in reaching the point at which they can maximize its sale by taking an active monitoring role in the company. The PE fund acts as a financial intermediary, by taking its investors' money and investing it in private companies in which it sees an opportunity to grow and eventually sell (Metric and Yasuda, 2011).

The PE can get divided into four main subclasses: Venture Capital (VC), mezzanine, buyout, and distress. The Venture Capital and the Buyout are the most important within it. The Venture Capital subclass is attributed to investments on companies that are, usually, young, driven by technology and with high growth potential. Most of these young firms do not have the option of getting financed by debt because generally these companies are not profitable and lack tangible assets. "The operations classified as Buyout are operations in which the PE fund buys all or at least the majority of an existing business, taking control over it" (Kaplan and Stromberg, 2009). The main differences between these two subclasses are the age of firms they usually invest in and the percentage of control they take on.

2.2 Types of Investors

The Venture Capital presents itself as an alternative source of outside equity financing, alongside angel investors and corporate investors. The main difference between these alternatives is whose money they use and in the name of who are they investing in. The VC funds invest in the name of their limited partners, the corporate investors in the name of their shareholders and the angel investors work to their own benefit only (Denis, 2004).

2.3 Investment Stages

The Venture Capital itself can be divided according to which stage the investee company is in. The most common stages are seed, start-up, and later-stage. A company considered to be at a seed stage will use the capital provided by the VC fund to complete its research, its product definition or design, or create prototypes of the same. A firm at the start-up stage usually has its product or service fully developed and will most likely use the funding to start mass production of its product or cover marketing expenditures. The later-stage funding usually refers to investments in already operational firms that are probably already backed-up by other VCs. (Invest Europe, 2017)

2.4 Venture Capitalist Role

"In essence, the Venture capitalist buys a stake in an entrepreneur's idea, nurtures it for a short period, usually not more than ten years, and exit it." (Zider, 1998) The goal of the venture capitalists is the profit. To achieve that purpose, they take an active position in the company they buy a stake on, work in order to raise the valuation of that company and sell that stake at a profit in the end (Gupta & Sapienza, 1992; Kaplan & Stromberg, 2002). "The VC can be viewed as a trail-wise sidekick to the entrepreneur ready to help the hero through all the tight spots - in exchange, of course, for a piece of the action" (Zider, 1998).

2.4.1 Screening and Monitoring

There is considered to be four different main players in the Venture Capital industry. The entrepreneurs, the investors, the investment banks and the venture capitalists. They all satisfy the needs of the others by creating a market for themselves in which they all can thrive, through the constant movement of money either as a fund or as a return (Zider, 1998).

The borrower-lender relationship can become expensive due to costs related to adverse selection and moral hazard. The VC firms diminish these risks by acting as a financial intermediary (Jeng

and Wells, 2000). VCs, in order to address these information issues, use measures like sharing the investment with other venture capital firms (reducing risk), assuming a position on the firm's board of directors (better monitor and control position) or splitting over time their investment on the firm. (Gompers and Lerner, 2001).

VCs separate themselves from other financial intermediaries like banks because they do not only lend the money to their investee, they offer value-adding services such as monitoring support or expert advice (Jain, 2001). Hellman and Puri (2002) found evidence that VCs provide valuable support in building the internal organization of the companies, and that these firms are more likely to professionalize different aspects like human resources policies, recruitment of professional marketing and sales staff. Besides the monitoring support, VCs are also believed to certify the quality of the start-up, increasing the chances of a higher amount of funds being raised. A trademark of competence and honesty is something that the VCs search for, in order to increase their chances of building relationships with potential investors on the fund. (Megginson and Weiss, 1991)

2.4.2 Exit Strategies

The last part of a VC investment, the exit, it is so important that the decision of investing in a company can be profoundly influenced by the feasible way of exit and the potential profit that come from it (Kaplan & Stromberg, 2002; Cumming & Fleming, 2002).

The VCs, usually choose one of the next five options to exit their investments: an IPO, an acquisition exit, a write-off, a buyback or a secondary sale. On an IPO, the firm sells off its shares to public investors. The acquisition exit occurs when a third party buys the entire firm. This third party is, usually, called a "strategic acquiror," and usually plays the role of a competitor, a customer or a supplier of the purchased firm. The mix of the two previous exit strategies, that is, when the VC sells its shares to a third party (usually a strategic buyer), it is called a secondary sale type of exit. The buyback is when shares owned by the VC are repurchased by the entrepreneur. The write-off exit strategy is put into action when the VC gives up on its investment, possibly assuming a passive role in the company. The IPO is the preferred exit method for the more valuable companies (Cumming and MacIntosh,2003).

2.5 VC Backed-Up Firms

Most empirical studies show that VC-backed companies outperform non-VC-backed companies. Berger and Udell (1998) in their analysis on the financial growth cycle and the impact of debt markets and private equity on it, attributed to the pre-investment screening and monitoring activities and the value added by the VC funds the reasons why, in their opinion, the companies backed by VC tend to exceed in results the non-VC-backed firms.

Engel (2002) studies the impact of VC funds in the performing of German companies by analyzing the evolution of financial and accounting indicators, comparing them with non-VC backed-firms. He concluded that firms that were backed-up by VCs have higher growth rates than non-VC-backed-up firms and allocated the reason of that growth to the more profit-oriented mind of venture capitalists. He also attributed the results to the better ability of venture capitalists, when compared with other investors, to make the companies they invest in have higher and faster employment growth. He reckoned that, at least, on short-term VC funds have a positive impact in the firms that they back up.

Alemany and Marty (2005) analyzed a group of Spanish firms that were backed-up by VCs from 1993 or later and compared their economic evolution to a control group with similar characteristics. They found evidence that VC backed-up companies grow faster regarding employment, sales and total assets than non-VC-backed-up firms, concluding that VC funding has a positive impact in the backed-up firms.

Sérgio Veloso (2012) analyzed the impact of VC funds in Portuguese companies backed by it and compared the evolution of their accountant indicators during a period starting one year before the VC investment until three years after the same. He also evaluates the evolution of those firm indicators with the evolution of the same indicators but for the sectors that the VC backed firms were in. He concluded that VC funds tend to have a positive impact in the firms they invest in, with these firms presenting good positives variations regarding growth, profitability, and productivity, contributing positively for the growth and development of the VC market in Portugal.

Using a sample of more than 600 entrepreneurial firms, 267 of them were VC-backed-firms, Croce, Marti and Murtinu (2013) compared the productivity growth of the firms before the first VC round and did not find any significant differences. However when they compared the same productivity growth but for the period after the first VC round, the authors found evidence of significantly higher productivity growth in those firms backed-up by VC, attributing this difference to the value added by the VC fund. When they analyzed the same firms after the exit of the VCs, they found that there was no decrease in the measures of productivity growth, attributing the results to imprinting effected caused by the VCs. The authors deduced that the VCs tend to have a positive impact in the firms backed-up by them and that the impact seems to continue even after their exit.

3. Private Equity and Venture Capital in Portugal

Portugal is a bank-oriented country, where the venture capital is generally used as a substitute financing source of the bank loans for the development or expansion of mature businesses. Because of that, the VC impact in the Portuguese Economy is almost small, assuming practically a passive role in support of the Portuguese innovation and entrepreneurship (Duarte, 2006)

Groh, Liechtenstein, and Lieser (2010) calculated the attractiveness indices for Venture Capital and Private Equity of 27 European Union Countries plus Switzerland and Norway. They identified six key drivers that affect a country's attractiveness: Economic Activity, Depth of Capital Market, Taxation, Investor Protection, and Corporate Governance. Portugal was ranked 13th, before France (15th), Italy (20th) and Spain (22nd). The top positions were occupied by UK (1st), Ireland (2nd) and Denmark (3rd).

Right now, there are 107 capital funds and 46 capital societies registered in Portugal, according to CMVM.

By analyzing the table 1, with data from Invest Europe, that shows the distribution of PE Investment in Portugal through the different entry stages, it is possible to notice on the rise of both the amount spend in Venture Capital and the number of companies backed up, going from almost 38 million € (81 companies) in 2013 to nearly 60 million € (104 companies) in 2015. This represents an increase regarding weight on the total amount of PE investment from 11% (2013) to 39% (2015). It is also important to notice that, even though the total amount of Investment decreased from 339 million € in 2013 to 152 million € in 2015, the amount invested in Venture Capital increased more than 50%. This data shows the continuous increase of the importance of VC within the Portuguese risk capital industry.

Table 1: PE Investment in Portugal by entry stage

	2013				2015			
	Amount	%	Number of companies	%	Amount	%	Number of companies	%
Seed	5 653,00 €	1,67	24	16,11	4 945,00 €	3,25	26	16,25
Start-up	26 880,81 €	7,93	50	33,56	43 100,00 €	28,34	75	46,88
Later stage venture	5 425,98 €	1,60	9	6,04	10 635,00 €	6,99	3	1,88
Total venture	**37 959,79 €**	**11,19**	**81**	**55,70**	**58 680,00 €**	**38,58**	**104**	**65,00**
Growth	81 671,00 €	24,08	15	10,07	30 721,00 €	20,20	24	15,00
Rescue/Turnaround	0,00 €	0,00	0	0,00	0,00 €	0,00	0	0,00
Replacement capital	9 975,00 €	2,94	12	8,05	13 227,00 €	8,70	5	3,13
Buyout	209 517,60 €	61,78	39	26,17	49 467,67 €	32,52	27	16,88
Total Investment	**339 123,39 €**	**100**	**143**	**100**	**152 095,67 €**	**100,00**	**160**	**100,00**

Amounts in € thousands *Source: Invest Europe, 2016*

When considering the data from Invest Europe with the distribution of PE Investment by sector, it is possible to notice that in 2013 there were four significant sectors: Energy & Environment (19% share), Computer & Consumer Electronics (17% share) Financial Services (14% share) and Communications (12% share). In 2015, Computer & Consumer Electronics sector achieved 27% share, the Life Sciences came to the second place with 18% share and was followed by the Consumer Goods & Retail and the Communications sectors with 16% share each.

Table 2: VC Investment in Portugal by sector

	2013				2015			
Sector focus	Amount	%	Number of companies	%	Amount	%	Number of companies	%
Agriculture	- €	0,00	0	0,00	80,00 €	0,14	1	0,96
Business & industrial products	600,00 €	1,58	2	2,47	3 730,00 €	6,36	7	6,73
Business & industrial services	162,00 €	0,43	2	2,47	2 257,00 €	3,85	4	3,85
Chemicals & materials	1 076,80 €	2,84	2	2,47	729,00 €	1,24	3	2,88
Communications	4 647,00 €	12,24	8	9,88	9 129,00 €	15,56	14	13,46
Computer & consumer electronics	6 385,33 €	16,82	17	20,99	15 524,00 €	26,46	29	27,88
Construction	- €	0,00	0	0,00	- €	0,00	0	0,00
Consumer goods & retail	2 291,00 €	6,04	3	3,70	9 295,00 €	15,84	4	3,85
Consumer services	2 297,00 €	6,05	3	3,70	1 042,00 €	1,78	3	2,88
Energy & environment	7 183,66 €	18,92	8	9,88	3 933,00 €	6,70	4	3,85
Financial services	5 212,00 €	13,73	7	8,64	125,00 €	0,21	2	1,92
Life sciences	3 411,00 €	8,99	13	16,05	10 604,00 €	18,07	21	20,19
Real estate	- €	0,00	0	0,00	- €	0,00	0	0,00
Transportation	- €	0,00	0	0,00	700,00 €	1,19	1	0,96
Unclassified	4 694,00 €	12,37	16	19,75	1 532,00 €	2,61	11	10,58
Total investment	**37 959,79 €**	**100**	**81**	**100**	**58 680,00 €**	**100,00**	**104**	**100,00**

Amounts in € thousands *Source: Invest Europe, 2016*

In 2015, according to Invest Europe, there were 57 VC divestments worth a total of 88 million €. More than 50 % of the amount (56 million €) were by write-off, and 25 % were either by sale to management (13%) or by sale to the financial institution (12%). The total amount of VC divested represented 25% of the amount of PE that was divestment.

Table 3: VC in Portugal by an exit strategy

	2015			
Exit route	**Amount at cost**	**%**	**Number of companies**	**%**
Divestment by trade sale	192,00 €	0,22	1	1,75
Divestment by public offering	- €	0,00	0	0,00
Divestment on flotation (IPO)	- €	0,00	0	0,00
Sale of quoted equity	- €	0,00	0	0,00
Divestment by write-off	56 501,01 €	64,21	28	49,12
Repayment of silent partnerships	639,00 €	0,73	1	1,75
Repayment of principal loans	7 174,00 €	8,15	4	7,02
Sale to another private equity house	1 385,00 €	1,57	1	1,75
Sale to financial institution	10 243,59 €	11,64	13	22,81
Sale to management	11 865,00 €	13,48	9	15,79
Divestment by other means	- €	0,00	0	0,00
Total divestment	**87 999,60 €**	**100,00**	**57**	**100,00**

Amounts in € thousands *Source: Invest Europe, 2016*

Portugal appears to be a more VC friendly country, and that can be seen in the growing importance of VC in the national economy as an alternative way of funding. However, is this growth in VC beneficial to the Portuguese companies backed-up by it?

4. The Impact of Venture Capital on the Portuguese companies

In this section is presented all the empiric work as well as the main conclusions regarding the impact of Venture Capital investment on the Portuguese companies. In the analysis, were considered a sample of 64 Portuguese companies who raised venture capital investment from players specialized in this type of investment. Initially, all the criteria used to define the sample are explained, as well as the main characteristics of the companies. The methodology is then presented. Lastly, the results of the analysis are shown, namely at the level of (i) growth, (ii) capital structure, (iii) profitability, (iv) productivity and (v) efficiency.

4.1 Sample

To obtain the sample with the companies that raised VC investment in Portugal, it was used the Capital IQ database, a database that aggregates global information regarding companies and investors from Standard & Poors.

The sample was firstly trimmed by, (i) only choosing the transactions that occur from 1 of January of 2004 until 31 of December of 2013, than there were only considered the deals (ii) that happened in Portugal (iii) in which the investors were classified as one of the following categories: "Financial Service Investment Arm", "Corporate Investment Arm", "Private Investment Firm", "Public Investment Firm", "All Investment Firms", "Public Fund", "Private Fund (Special Purpose Issuer Trust)" or "Government Institution" and in which (iv) the primary feature was Venture Capital. There were selected 119 transactions.

Secondly, it was defined that the investee company should have a maximum of ten years of existence at the moment the VC invested on it. Remained 118 transactions.

Thirdly, the transaction in which the goal of the del was not considered as VC were eliminated[1]. There were 110 transactions left.

[1]. An example of this transactions are the ones made by "TC Turismo Capital – SCR," which is classified as PE and VC fund for the construction of hotels. There were found eight similar transactions.

Additionally, only first times raise by the investee firm in the time frame of the analysis were considered. There were excluded nine transactions, remaining 101.

Lastly, to obtain the accounting information of each company, as well as information regarding the sector of activity, it was used the SABI database provided by Bureau Van Dijk. This way, all the transactions of which the information regarding the company was not available were removed (38 companies). 63 companies constitute the final sample in which this dissertation focused its attention. It is natural that the sample is smaller for some analysis because for some years some of the information was not available,

4.2 Methodology

There were considered three variables from a period between a year before the investment (n-1) until three years after the same (n+3). The variables were (i) Total Assets, (ii) Sales Volume and (iii) EBITDA (earnings before interests, taxes, depreciation, and amortization).

The impact of the VC investment in the capital structure of the companies backed by it, it was analyzed by using the financial autonomy ratio (Equity/Assets).

There were taken into analysis three indicators: (i) EBITDA Margin[2], as a measure of profitability (ii) Asset profitability[3] as a measure of productivity and (iii) Asset Rotation[4] as a measure of efficiency; to measure the impact of VC investment on the operational measure.

The analysis was made by measuring the percentage changes of the previous mentioned variables in the years after the investment [(n+1), (n+2),(n+3)] regarding the previous year. The analysis was made following the formula $(X_i^{n+t} - X_i^{n+t-1})/X_i^{n+t-1}$, where i is the company, n the year of the investment and t the number of years after the investment.

In order to neutralize the impact that the sector of each company (considering the CAE Rev.3 of each company), may have into the final results, there was used information of the variables under analysis from Banco the Portugal for each sector of activity. The final results of the

[2] EBITDA Margin / Revenues
[3] EBITDA / Total Assets
[4] Revenues / Total Assets

operational performance analysis of each company were then calculated by subtracting the change of the indicators of the sector of activity of each company from the previous results of each company before taking into the account the sector of activity of the same, for the same period.

In order to test the significance of the results presented, the Wilcoxon test was performed in each of the indicators, testing if the median of each result was significantly different from zero.

With the goal of analyzing if the age of the company at the moment that it received VC investment is a relevant factor that may have an impact in the results, a division within the companies under analysis was made. Two subgroups were created with that objective in mind ("new companies" and "companies previously created"). The former represents the companies that were less than one year old at the time that they received VC investment, while the latter stands for the companies that were previously created, meaning that more than one year had passed since the moment they were created until the moment a VC firm funded them. The methodology explained earlier was first applied to the full sample and only after to these two subsamples.

4.3 Sample Information

As it is possible to see in Table 4, the year where the number of transactions was higher was 2006 (17), in the following years the number of transactions decreased, but in 2012 (10) the number grow up again, setting the second highest record during the time frame in the analysis.

Table 4: Distribution of transactions per year

Year	Nº Operations
2004	3
2005	3
2006	17
2007	8
2008	5
2009	6
2010	3
2011	3
2012	10
2013	5
Total	**63**

Most of the operations occurred in companies that act in three sectors: the information and communication activities, the transformation industries and in the consulting activities; representing more than 50% of the companies in the sample.

Table 5: Distribution of transactions per sector

Sector	Nº Operations	Percentage
Atividades de Informação e Comunicação	14	22,22%
Industrias Transformadoras	12	19,05%
Atividades de Consultoria, Cientificas, Técnicas e Similares	11	17,46%
Comércio por Grosso e Retalho: Reparação de Veículos, Automóveis e Motociclos	5	7,94%
Atividades Admnistrativas e dos Serviços de Apoio	5	7,94%
Outros	16	25,40%
Total	**63**	**100%**

Table 6 presents the characteristics of the target companies for analysis of this thesis in the year in which the VC investment was made. It is important to highlight that the companies in the sample have in average (median) more than 14 million euros (1,3 million) in total assets (with a standard deviation of more than 52 million), a reduced number of employees (15 on average), a negative median in the operational result, but still young with an average of 2,29 years.

Table 6: Characteristics of the companies present in the sample

Variable	Average	Median	Standard Deviation	Nº of observations
Total Assets*	14074,18	1310,93	52126,45	53
Revenues*	2252,93	22,75	8828,33	53
EBITDA*	302,54	-54,26	2797,54	53
Age	2,29	1,00	2,56	63
Nº of employees	15	4	41	52

*values in thousands of euros

When comparing the two different subsamples, it is possible to verify that the differences between them are not that significant, being the size of the companies the primary factor that separates them, with the companies in the "Companies Previously Created" subsample presenting the more significant dimensions in average.

Table 7: Characteristics of the companies present in the sample, per subsample

New Companies

Variable	Average	Median	Standard Deviation	Nº of observations
Total Assets*	6996,80	1262,20	18934,44	17
Revenues*	1031,63	0,00	3141,20	17
EBITDA*	635,52	-32,46	2932,16	17
Nº of employees	3	1	4	16

*values in thousands of euros

Previously Created Companies

Variable	Average	Median	Standard Deviation	Nº of observations
Total Assets*	17416,28	1349,80	61945,34	36
Revenues*	2829,65	94,65	10498,50	36
EBITDA*	145,30	-80,78	2760,06	36
Nº of employees	20	5	49	36

*values in thousands of euros

4.4 Growth

In this section, the goal is to measure the impact of the VC investment in the growth of the companies under the analysis of this thesis. With that in mind, there were considered three accounting indicators (i)Total Assets, (ii) Revenues and (iii) EBITDA.

Table 8 shows the median value of the changes in those indicators before and after the VC investment. When analyzing the results, it is essential to refer the 111,23% increase in the Total Assets indicator statistically significant at a 5% level. In the Revenues and EBITDA indicators it is also important to mention the 22,28% increase of the former between the year previous to the investment and the year of the investment, statistically significant at a 1% level, and a 35,66% increase in the same period in the later indicator statistically significant at a 10% level. All of these results can be fully allocated to the "Companies Previously Created" sub-sample because the "New Companies" are not part of that period analysis.

Table 8. Changes in the growth variables of the companies after the operation

Total Sample **Year related to the date of operation**	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. Total Assets				
% Change (median)	111,23%**	6,70%	6,03%	0,08%
Nº observations	28	50	50	50
B. Revenues				
% Change (median)	22,28%***	53,50%	26,52%	16,80%
Nº observations	20	36	37	38
C. EBITDA				
% Change (median)	35,66%*	0,67%	-15,81%	-11,44%
Nº observations	28	50	50	50

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

When analyzing the subsamples results it is worth mention the continued growth of the Revenues indicators in both of the sub-samples, having the "New Companies" presented a positive variation of 280% within the year following the VC investment, a result statistically significant at a 5% level, maintaining the positive growth in the following years. The "Companies Previously Created" besides the growth of 22,28% previously mentioned, maintained that positive trend during the period under analysis, presenting at the period from year n+1 and year n+2 a growth of 33,79% in the Revenues indicator, a result statistically significant at a 1% level.

Table 9. Changes in the growth variables of the companies after the operation, per subsample

New Companies

Year related to the date of operation	n…n+1	n+1…n+2	n+2…n+3
A. Total Assets			
% Change (median)	5,36%	-0,24%	-0,59%
Nº observations	16	18	19
B. Revenues			
% Change (median)	280%**	15,26%	2,01%
Nº observations	8	10	10
C. EBITDA			
% Change (median)	0,67%	6,01%	-22,73%
Nº observations	16	18	19

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

Companies Previously Created

Year related to the date of operation	n-1…n	n…n+1	n+1…n+2	n+2…n+3
A. Total Assets				
% Change (median)	111,23%**	11,70%	12,55%	1,24%
Nº observations	28	34	32	31
B. Revenues				
% Change (median)	22,28%***	36,24%	33,79%***	24,39%
Nº observations	20	28	27	28
C. EBITDA				
% Change (median)	35,66%*	-2,67%	-48,20%	-10,14%
Nº observations	27	34	31	31

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

Overall, with the analysis of these tables, it is possible to conclude that the companies in the period previous to the VC investment present positive result throughout all three indicators under analysis, with those results being statistically significant at different levels. It is also important to mention the positive impact of the VC investment mainly in the Revenues category in the following years of investment with special mention to the 280% change in the year following the investment in the "New Companies" sub-sample. Summing up, the VC investment seems to have a positive impact on firms' total assets and revenues, and a negative impact on the firms' EBITDA.

4.5 Capital Structure

To analyze the impact of the VC investment in the Capital Structure of the companies was used the Financial Autonomy ratio (Equity / Assets). Using the Table 10, it is possible to see that the "New Companies" sub-sample have a -18,84% variation in their financial autonomy, a result statistically significant at a 1% level This value may be explained through the fact that when the companies need extra investment, they obtain it through debt, decreasing this way the Financial Autonomy ratio.

Table 10. Changes in the Capital Structure of the companies after the operation

Total Sample **Year related to the date of operation**	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. Financial Autonomy				
% Change (median)	-0,13%	-14,41%	-3,63%	-1,21%
Nº observations	28	50	50	50
A1. New Companies				
% Change (median)	-	-18,84%***	0,01%	0,66%
Nº observations	-	16	18	19
A2. Companies Previously Created				
% Change (median)	-0,13%	-12,23%	-7,67%	-2,84%
Nº observations	28	34	32	31

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

4.6 Profitability

Table 11 shows the changes in the profitability variables of the companies after the operation, with those changes being measured using the EBITDA margin measure (EBITDA / Revenues).

Table 11. Changes in the profitability variables of the companies after the operation

Total Sample **Year related to the date of operation**	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. EBITDA / Revenues				
% Change (median)	-89,85%	-60,71%	-78,37%	-11,57%
Nº observations	20	35	36	37
% Change (median) ajust. Ind	-84,84%	-80,78%	-72,17%	-86,13%
Nº observations	20	35	36	37

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

By analyzing this variable at the sub-sample level, it is essential to highlight the negative variation of both "New Companies" and "Previously Created Companies" in the period of n+1 and n+2. In that period, the "New Companies" presented a negative variation of -13.77%, a result statistically significant at a 10% level and the "Companies Previously Created" presented a negative variation of -87.89% variation, statistically significant at a 1% level. This indicator continued to decrease in the "Previously Created Companies", reaching a negative variation of -41,76% in the period between n+2 and n+3, a result statistically significant at a 5% level.

Table 12. Changes in the profitability variables of the companies after the operation, per subsample

New Companies **Year related to the date of operation**	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. EBITDA / Revenues				
% Change (median)		-57,39%	-13,77%*	33,14%
Nº observations		8	9	10
% Change (median) ajust. Ind		-56,28%	4,86%	-43,58%
Nº observations		8	9	10

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

Companies Previously Created **Year related to the date of operation**	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. EBITDA / Revenues				
% Change (median)	-89,85%	-60,71%	-87,89%***	-41,76%**
Nº observations	20	27	27	27
% Change (median) ajust. Ind	-84,84%	-81,77%	-76,84%	-93,54%
Nº observations	20	27	27	27

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

With the results presented in these previous tables, the VCs seem to have a negative impact in the companies they invest in regarding profitability. This may be connected with the possibility

of these investments being long-term investments, which results may only appear in a period not considered in this analysis.

4.7 Productivity

The (EBITDA / Assets) ratio is used as a proxy for the productivity of the companies. Table 13 presents the results.

Table 13. Changes in the productivity variables of the companies after the operation

Total Sample				
Year related to the date of operation	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. EBITDA / Assets				
% Change (median)	-67,54%	-17,31%	-52,91%	-21,04%
Nº observations	28	50	50	50
% Change (median) ajust. Ind	-73,09%	-21,75%	-37,03%	-28,72%
Nº observations	28	50	50	50

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

When analyzing the Table 14, it is essential to highlight the positive variation of the ratio in the "New Companies" subsample in the year after the investment (27,10%), a result statistically significant at a 10% level. This result contrasts with the all the remaining results for the different time periods under analysis, from the same subsample as also from the "Companies Previously Created". In the following year of that positive change, the "New Companies" had a negative variation of the indicator, reaching a -6,75% variation, statistically significant at a 10% level, going in the same direction as the "Old Companies" when considering the direction of change of the indicator.

Table 14. Changes in the productivity variables of the companies after the operation, per subsample

New Companies

Year related to the date of operation	n-1…n	n…n+1	n+1…n+2	n+2…n+3
A. EBITDA / Assets				
% Change (median)		27,1%*	-6,75%*	-22,79%
Nº observations		16	18	19
% Change (median) ajust. Ind		15,50%	1,36%	-25,44%
Nº observations		16	18	19

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

Companies Previously Created

Year related to the date of operation	n-1…n	n…n+1	n+1…n+2	n+2…n+3
A. EBITDA / Assets				
% Change (median)	-67,54%	-27,01%	-67,00%	-20,05%
Nº observations	28	34	32	31
% Change (median) ajust. Ind	-73,09%	-34,14%	-73,62%	-32,00%
Nº observations	28	34	32	31

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

This way, it is possible to conclude that the company's performance concerning productivity was below the expected, when compared to the activity sectors that the companies are in, but it may also be a sign of the types of investment that were made, which results may only be seen in a more distant future than the one under analysis.

4.8 Efficiency

Table 15 presents the evolution of the Asset Rotation ratio (Revenues / Assets). These results allow the analysis of the use of the assets regarding efficiency.

Table 15. Changes in the efficiency variables of the companies after the operation

Total Sample				
Year related to the date of operation	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. Revenues / Assets				
% Change (median)	-25,50%	56,27%	4,97%	-1,12%
Nº observations	21	36	37	38
% Change (median) ajust. Ind	-23,97%	57,55%	10,76%	0,73%
Nº observations	21	36	37	38

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

By analyzing the same ratio but on the subsample level, it is important to notice the positive variation presented by the "New Companies" in the year following the investment (204,17%), a result statistically significant at a 5% level, going negative in the following years.

Table 16. Changes in the efficiency variables of the companies after the operation, per subsample

New Companies				
Year related to the date of operation	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. Revenues / Assets				
% Change (median)		204,17%**	-12,68%	-1,12%
Nº observations		8	10	10
% Change (median) ajust. Ind		201,79%	-9,87%	-1,74%
Nº observations		8	10	10

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

Companies Previously Created				
Year related to the date of operation	**n-1…n**	**n…n+1**	**n+1…n+2**	**n+2…n+3**
A. Revenues / Assets				
% Change (median)	-25,50%	22,02%	14,10%	-0,31%
Nº observations	21	28	27	28
% Change (median) ajust. Ind	-23,97%	26,39%	22,22%	2,40%
Nº observations	21	28	27	28

*,**,*** statistically different from zero with a significance level of 10%, 5%, and 1%, respectively

This ratio allows the perception of the functional impact that the VC investment may have in the year following the investment concerning efficiency, but that impact seems to vanish in the following years, turning itself into negative side.

5. Conclusion

The Private Equity and the Venture Capital itself have been increasing their importance in the Portuguese landscape, allowing the development of the Portuguese industries, with more focus on the start-ups and technology-driven businesses. However, when compared with countries like U.S.A and U.K. we are still far behind them.

Although it is a hot topic in Portuguese newspapers, it is essential to clarify what Venture Capital is, which may raise the availability of the Portuguese to try this alternative way of financing.

With the analysis made on the impact of Venture Capital in companies backed by it in Portugal, it was possible to see the rise in revenues and assets of the same during all period on analysis after being backed by VC. However the impact of that investment on the EBITDA was positive in the first two years after the investment, and after it turned negative.

The capital structure of the companies was negatively impacted by the VC investment, with that impact being more significant in the "New Companies" during the first year after the investment.

The "Companies Previously Created" were that most suffered in the profitability indicator, having in the period between n+1 and n+2 a negative variation of almost 88%. Hen looking at the productivity measures, the "New Companies" presented a positive variation of 27,1% between n and n+1.

It is important to highlight the more than 200% positive variation in the efficiency indicator in the "New Companies" during n and n+1.

To sum up, even though the overall impact of VC in the companies is not clear, this type of financing is raising its importance in the Portuguese landscape, and we can expect a continuous rise of it in the following years.

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